

1 What is claimed is:

2 1. A method for imprinting indicia markings onto a surface of an object, the markings  
3 penetrating beneath said object surface to thereby impart abrasion and wear resistance to said  
4 markings, said method comprising the steps of;

5 a. applying to preselected regions of said object surface having outline  
6 shapes corresponding to indicia to be imprinted a semi-liquid peelable ink including,

7 I. a solvent,

8 II. a dye held in solution, in said solvent, and

9 III. a film-forming substance,

10 b. allowing sufficient time for said dye to penetrate said object surface,

11 c. allowing sufficient time for said solvent to evaporate and cause said film-  
12 forming substance to form a solid film peelable from said object surface, and

13 d. peeling said solid film from said object surface, thereby leaving said indicia  
14 markings imprinted on and dye-penetrated into said object surface.

15 2. The method of Claim 1 wherein said semi-liquid peelable ink is applied to said  
16 object surface through openings through a stencil sheet.

17 3. The method of Claim 2 wherein said stencil sheet has a reverse surface which  
18 is conformed to said object surface prior to applying said peelable ink to said surface.

19 4. The method of Claim 3 wherein said stencil sheet is conformed in fluid-tight  
20 contact with said object surface by means of a pressure-sensitive adhesive layer between said  
21 object surface and a reverse side of said stencil sheet.

22 5. The method of Claim 4 further including the step of peeling said stencil sheet from  
23 said object surface.

24 6. The method of Claim 5 wherein said film-forming substance is further defined as  
25 forming upon said evaporation of said solvent a film which is sufficiently lightly adhered to said  
26 object surface to be peelable therefrom without damaging said object surface, and sufficiently  
27 tightly adhered to said stencil sheet to remain attached thereto when said stencil sheet is  
28 peeled from said object surface.

1           7.     The method of Claim 1 wherein said film-forming substance is further defined as  
2 a polymer soluble in said dye-solvent solution.

3           8.     The method of Claim 1 wherein the material of which said object surface is made  
4 is further defined as being a leather.

5           9.     The method of Claim 1 wherein the material of which said object surface is made  
6 is further defined as being a polymer.

7           10.    The method of Claim 9 wherein said polymer is further defined as being a  
8 thermoplastic.

9           11.    A peelable stenciling ink for imprinting a surface of an article by applying said ink  
10 to said article surface, said ink comprising;

11               a.     a solvent,

12               b.     a dye dispersable in said solvent to form a dye-solvent solution, and

13               c.     a film-forming substance soluble in said dye-solvent solution and  
14 hardenable into a solid film upon evaporation of said solvent from said ink, said solid film being  
15 peelable from said article surface.

16           12.    The ink of Claim 11 wherein said dye-solvent solution is penetratable into said  
17 article surface.

18           13.    The ink of Claim 11 wherein said solid film formed by said film-forming substance  
19 is peelable from said article surface.

20           14.    The ink of Claim 13 wherein said film-forming substance is a polymer.

21           15.    The ink of Claim 13 wherein said film-forming substance is a resin.

22           16.    The ink of Claim 11 further including a release agent for facilitating peelability of  
23 said solid film from said article surface.

24           17.    The ink of Claim 11 wherein said solvent is further defined as being able to  
25 partially dissolve said article surface.

26           18.    The ink of Claim 11 wherein said solvent is further defined as being able to swell  
27 said article surface.

1           19.    The ink of Claim 11 wherein said dye comprises from about two percent to about  
2 nine percent by weight of said ink.

3           20.    The ink of Claim 11 wherein said film-forming substance comprises from about  
4 eleven percent to about forty-six percent by weight of said ink.

5           21.    The ink of Claim 11 wherein said solid film has a thickness of greater than about  
6 two percent of a non-evaporated layer of said ink.

7           22.    A peelable stenciling ink for imprinting and dyeing a surface of an article by  
8 applying said ink to said article surface, said ink comprising;

9               a.    a solvent,

10              b.    a dye dispersed in said solvent to form a dye-solvent solution capable of  
11 penetrating an article surface, and

12              c.    a film-forming substance soluble in said dye-solvent solution and capable  
13 of holding said dye-solvent solution in contact with said article surface, and hardenable into a  
14 solid, flexible film upon evaporation of said solvent from said ink, said solid film being peelable  
15 from said article surface.

16           23.    The ink of Claim 22 wherein said solvent consists at least in part of water.

17           24.    The ink of Claim 23 wherein said film-forming substance is soluble in water.

18           25.    The ink of Claim 24 wherein said film-forming substance consists at least in part  
19 of hydroxyethyl cellulose.

20           26.    The ink of Claim 24 wherein said film-forming substance consists at least in part  
21 of polyvinyl alcohol.

22           27.    The ink of Claim 22 wherein said solvent is a hydrocarbon.

23           28.    The ink of Claim 27 wherein said film-forming substance is a polymer.

24           29.    The ink of Claim 28 further including a release agent for moderating adherence  
25 between said article surface and said hardened film.

26           30.    The ink of Claim 28 wherein said solvent is further defined as comprising about  
27 45 percent of xylene and about 11 percent of n-butanol, relative to the total weight of said ink.  
28

1        31. The ink of Claim 30 wherein said film-forming polymer is further defined as  
2 comprising about 22 percent of ethyl cellulose, relative to the total weight of said ink.

3        32. The ink of Claim 31 wherein said dye is further defined as comprising about 5.6  
4 percent of the total weight of said ink.

5        33. The ink of Claim 32 wherein said dye is further defined as being an azo dye.

6        34. The ink of Claim 33 further including a release agent.

7        35. The ink of Claim 34 wherein said release agent is further defined as including  
8 about 11 percent mineral oil, relative to the total weight of said ink.

9        36. The ink of Claim 35 wherein said release agent is further defined as including  
10 about 5.5 percent castor oil, relative to the total weight of said ink.

11       37. A peelable dye-stenciling ink for imprinting and dyeing an article surface by  
12 applying said ink to said article surface, said ink being a viscous, paste-like liquid comprising;

13            a. about 46 to 88 parts by weight of a solvent,

14            b. about 2-10 parts by weight of a dye dispersable in said solvent to form  
15 a dye solvent solution capable of penetrating an article surface, and

16            c. about 11 to 46 parts by weight of a film-forming polymer soluble in said  
17 dye-solvent solution and capable of holding said dye-solvent solution in contact with said article  
18 surface, and hardenable into a solid, flexible film upon evaporation of solvent from said ink, said  
19 solid film being peelable from said article surface.

20       38. The ink of Claim 37 wherein said solvent is selected from the group consisting  
21 of water, ethanol, n-butanol, methanol, propanol, isopropanol, iso-butanol, amyl alcohol, benzyl  
22 alcohol, hexane, cyclohexanone, methyl cyclohexanone, methyl ethyl ketone, methyl isobutyl  
23 ketone, acetone, benzene, chloroform, methylene chloride, carbon tetrachloride, ethylene  
24 dichloride, -butyl acetate, ethyl acetate, propyl acetate, isopropyl acetate, amyl acetate, methyl  
25 cellosolve acetate, cellosolve acetate, benzyl acetate, methyl formate, ethyl formate, ethyl  
26 lactate, butyl lactate, ethylene glycol, monoethyl ether, ethyl ether, methyl cellosolve, cellosolve,  
27 butyl cellosolve, toluene, xylene, tetralin, dioxane and pine oil.

1           39. The ink of Claim 37 wherein said dye is selected from the group consisting of  
2 azo, monoazo, trisazo, polyazo, diazo, disazo, azoic, stilbene, diphenylmethane,  
3 triarylmethane, acridine, azine, ketone imine, methane, nitro, nitroso, oxazine, thiazine, sulphur,  
4 lactone, indigoid, quinoline, methine, thiazole, indamine, xanthene, phthalocyanine, and  
5 anthraquinone.

6           40. The ink of Claim 37 wherein said dye is selected from the group consisting of  
7 acid, mordant, natural dyes, food, leather, direct, reactive, solvent, pigment, basic, spirit oil, vat  
8 and disperse dyes.

9           41. The ink of Claim 37 wherein said film-forming polymer is selected from the group  
10 consisting of natural resins, rubber derivatives, and cellulose derivatives; including cellulose  
11 esters such as cellulose nitrate, cellulose acetate, cellulose acetate-butyrate and cellulose  
12 propionate and cellulose ethers such as methyl cellulose, ethyl cellulose and carboxymethyl  
13 cellulose, varnishes, synthetic resins, alkyd resins and those resins formed by condensation  
14 polymerization such as phenolic resins, amino resins, polyesters, polyurethanes, polyamides,  
15 epoxides and polyethers; polyethylene, polypropylene, polyisobutylene, fluorocarbon polymers,  
16 polyvinyl acetate and its derivatives such as polyvinyl alcohol, vinyl polymers and copolymers,  
17 vinyl chloride polymers and copolymers, polyvinylidene chloride, polystyrene, acrylic polymers,  
18 coumarone-indene polymers, polyvinyl ethers, polyvinyl ketones, polyvinyl amines, fluorine-  
19 containing polymers and divinyl polymers; epoxy resins and synthetic rubbers and silicones and  
20 their derivatives.

21           42. The ink of Claim 37 further including a release agent for moderating adhesion  
22 of said solid film to said article surface.

23           43. The ink of Claim 42 wherein said release agent is selected from the group  
24 consisting of mineral oil, linseed oil, castor oil, silicone polymers, synthetic waxes, unsaturated  
25 fatty acid-monoamides, polyethylene glycol monostearate, fatty bisamides, and various  
26 plasticizers.